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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/967,307
Filing Date: September 28, 2001
Appellant(s): BATKE ET AL.

Keith M.Baxter (31,233)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 07/31/07 appealing from the Office action mailed 12/19/06.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,640,140	Lindner	10-2002
6,484,061	Papadopoulos	11-2002
6,061,603	Papadopoulos	5-2000
10-011325	Katsuhiko	1-1998
6,542,925	Brown	1-2003
6,799,077	Hauet	9-2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 4, 12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindner et al. (US 6,640,140) in view of Papadopoulos et al. (US 6,640,140).

Lindner teaches the invention substantially as claimed including PLC executive with integrated web server (see abstract).

As to claims 1, 12 and 14, Lindner teaches a Web interface module for an industrial control system, an industrial control system for an industrial control system and an industrial control system comprising: (Figure 1)

a plurality of I/O modules sending and receiving electrical signals to and from an industrial process (Figure 1, (23a, 23b and 23c));

a controller network communicating with the I/O modules (figure 1, (22b, 60)); a programmable logic controller attachable to the controller network to execute a stored control program to exchange data with the I/O modules over the controller network to control the industrial process (figure 1, (70)); and

a Web interface module (figure 1, (30a) including:

(a) an Internet interface for connecting to a Web accessing communications medium (figure 1, (33); figure 2);

(b) a network interface for connecting to the controller network figure 1, (22b)); and

(c) a processing unit executing a stored interface program to communicate

directly with at least one I/O module and to pass data between the Web accessing communications medium and the I/O module, the passing of data including the writing of data to the I/O modules defining the electrical signals to be sent by the I/O module to the industrial process and the reading of data from the I/O modules defined by electrical signals received by the I/O modules from the industrial process (figure 1, item 11, Lindner discloses the passing of data, which inherently includes the writing and the reading of data to and from the I/O modules. In addition, the limitation such as "the passing of data including **the writing of data** to the I/O modules defining the electrical signals to be sent by the I/O module to the industrial process and from the I/O modules defined by electrical signals received by the I/O modules the **reading of data** from the industrial process" implies that data is written and read to and from the I/O modules); Lindner fails to teach explicitly whereby communications may be had with the I/O module without intervention of the programmable logic controller.

However, Papadopoulos teaches web interface to a programmable controller. Papadopoulos teaches communications may be had with the I/O module without intervention of the programmable logic controller (figure 2; column 4, lines 39-53, Papadopoulos discloses a web The web server 30 provides a direct connection for a programmable logic controller (PLC) 32 to the Internet 14 by plugging the web server 30 into its back plane 34 (i.e. there is no intermediate device between the web server and the I/O (i.e. backplane, which is A **backplane** is a circuit board (usually a printed circuit board) that connects several connectors in parallel to each other, so that each pin of each connector is

linked to the same relative pin of all the other connectors, forming a computer bus. It is used as a backbone to connect several printed circuit board cards together to make up a complete computer system (see www.answers.com)), which is the case here since the PLC has no real direct connection to the server but by connecting the PLC to the server through the backplane (i.e. I/O). Therefore, there is communication between the web server and the I/O without the intervention of the PLC).

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with establishing communication with a remote client as taught by Papadopoulos, because this system would allow control over remote devices without the intervention of the controller's PLC.

As to claims 4 and 15, Lindner teaches the Web interface module and the industrial control system of claims 1 and 14 wherein the processing unit executing the stored program also opens at least one connection on the connected messaging network between the programmable logic controller and the Web interface to transfer data between the programmable logic controller and the interface (column 4, lines 19-59).

3. Claims 7-8, 18-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lindner et al. (US 6,640,140) in view of Papadopoulos et al. (US 6,061,603).

Lindner teaches the invention substantially as claimed including PLC executive with integrated web server (see abstract).

As to claim 7, Lindner substantially teaches the Web interface module of claim 1 wherein the processing unit executing the stored program opens connections on the connected messaging network with a plurality of I/O modules and wherein the processing unit includes an I/O image table and wherein the passing of data between the Web accessing communications medium and the I/O module separately reads and writes data between the Web accessing communications medium the I/O image table, and between the I/O modules and the I/O image table; where the transfer of data between the Web accessing communications medium and the I/O is implemented through the I/O image table. (See Fig. 1).

Lindner fails to address the reads and writes data and the I/O image table.

However, Papadopoulos specifically discloses read/write of data at col. 8 Table 1.

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the reads and writes data and the I/O image table as taught by Papadopoulos, because this system would afford greater control over remote devices.

As to claim 8, Lindner substantially teaches the Web interface module of claim 7 wherein the processing unit executing the stored program reads and writes data between the I/O image table and the I/O modules in a predetermined order. (See Fig. 1 (11), col. 4, lines 42-45 - a ladder program is executed rung by rung in a rigid manner). Lindner does not expressly address the reads and writes data and the I/O image table. However, Papadopoulos specifically discloses read/write of data at col. 8 Table 1. It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the reads and writes data and the I/O image table as taught by Papadopoulos, because this system would afford greater control over remote devices.

As to claim 18, Lindner substantially teaches the industrial control system of claim 14 wherein the processing unit executing the stored interface program opens connections on the connected messaging network with a plurality of I/O modules and wherein the processing unit includes an I/O image table and wherein the passing of data between the Web accessing communications medium and the I/O module separately reads and writes data between the Web accessing communications medium and the I/O image table, and between the I/O modules and the I/O image table; where the transfer of data between the Web accessing communications medium and the I/O is implemented through the I/O image table. (See Fig. 1 (22b, 60)).

Lindner does not expressly address the reads and writes data and the I/O

image table. However, Papadopoulos specifically discloses read/write of data at col. 8 Table 1. Hence, it would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the reads and writes data and the I/O image table as taught by Papadopoulos, because this system would afford greater control over remote devices.

As to claim 19, Lindner substantially teaches the industrial control system of claim 18 wherein the processing unit executing the stored interface program reads and writes data between the I/O image table and the I/O modules in a predetermined order. (See Fig. 1 (11), col. 4, lines 42-45 - a ladder program is executed rung by rung in a rigid manner).

Lindner does not expressly address the reads and writes data and the I/O image table. However, Papadopoulos specifically discloses read/write of data at col. 8 Table 1. It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the reads and writes data and the I/O image table as taught by Papadopoulos, because this system would afford greater control over remote devices

4. Claims 2, and 13 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lindner et al. (US 6,640,140) in view of Ichimura Katsuhiko (JP10-011325).

Lindner teaches the invention substantially as claimed including PLC executive with integrated web server (see abstract).

As to claim 2, Lindner substantially teaches the Web interface module of claim 1 wherein the processing unit also executes the stored program to receive a write disable command from the programmable logic controller causing the stored program to allow direct reading of data from the I/O module but not direct writing of data to the I/O module; whereby conflicting writing of data to the I/O module is prevented. (See col. 4, Lindner does not expressly address the reading and writing of data.

However, Ichimura specifically discloses read/write of data. (See Solution on page 1.)

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the reading and writing of data as taught by Ichimura, because this system would afford greater control over remote devices.

As to claim 13, Lindner substantially teaches the industrial control system of claim 1 wherein the processing unit also executes the stored program to receive a write disable command from the programmable logic controller causing the stored interface program to allow direct reading of data from the I/O module but not direct writing of data to the I/O module; whereby conflicting writing of data

to the I/O module is prevented. (See Fig.1.).

Lindner does not expressly address the reading and writing of data.

However, Ichimura specifically discloses read/write of data. See Solution. Hence, it would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the reading and writing of data as taught by Ichimura, because this system would afford greater control over remote devices.

5. Claims 5 and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lindner et al. (US 6,640,140) in view of Brown et al. (US 6,542,925.).

Lindner teaches the invention substantially as claimed including PLC executive with integrated web server (see abstract).

As to claim 5, Lindner teaches the Web interface module of claim 1 wherein the connected messaging network is selected from the group consisting of ControlNet, DeviceNet and EtherNet. (See Fig. 1 (22b, 60)) (See also Brown col. 4, lines 31-36.)

As to claim 16, Lindner teaches the industrial control system of claim 14 wherein the connected messaging network is selected from the group consisting of ControlNet, DeviceNet, and EtherNet. (See Fig. 1 (22b, 60)) (See also Brown

col. 4, lines 31-36.)

6. Claims 6, 9-11, 17 and 20-22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lindner et al. (US 6,640,140) in view of Brown et al. (US 6,542,925.) and in further view of Papadopoulos et al. (US 61061,603).

Lindner teaches the invention substantially as claimed including PLC executive with integrated web server (see abstract).

As to claim 6, Lindner teaches the Web interface module of claim 1 wherein the Web accessing communications medium is selected from the group consisting of a wire cable, and a radio link. (See Fig. 1).

Lindner does not expressly address fiber optic cable. However, Papadopoulos does at col. 4, lines 64-65.

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner with the fiber optic cable of Papadopoulos, because this system would be versatile.

As to claim 9, Lindner substantially teaches the Web interface module of claim 1 wherein the connected messaging network comprises a parallel backplane between the Web interface module and the programmable logic controller and a serial network between the backplane and the I/O modules.

Lindner does not expressly address a serial network as the messaging network.

However, Brown specifically discloses such network at col. 4, lines 25-35.

Hence, it would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the serial network as taught by Brown, because this system would be versatile. Neither Lindner nor Brown teaches a parallel backplane. However, Papadopoulos does at col. 4, lines 25-35.

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner and the serial network as taught by Brown with the backplane of Papadopoulos, because this system would be versatile. As to claim 10, Lindner substantially teaches the features of claim 9 as discussed above. Lindner does not expressly address the network interface of the Web interface module, which attaches to the backplane.

However, Papadopoulos specifically discloses such configuration. (See Fig. 2 and Fig. 3.).

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the configuration taught by Papadopoulos, because this system would be more robust.

As to claim 11, Lindner substantially teaches the features of claim 9 as discussed above. Lindner does not expressly address the network interface of

the Web interface module, which attaches to the serial network.

However, Brown specifically discloses the network interface of the Web interface module, which attaches to the serial network at col. 4, lines 25-35.

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the serial network taught by Brown, because this system would be versatile.

As to claim 17, Lindner substantially teaches the industrial control system of claim 14 wherein the Web accessing communications medium is selected from the group consisting of a wire cable, and a radio link. (See Fig. 1).

Lindner does not expressly address fiber optic cable.

However, Papadopoulos does at col. 4, lines 64-65.

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner with the fiber optic cable of Papadopoulos, because this system would be versatile.

As to claim 20, Lindner does not teach the industrial control system of claim 14 wherein the connected messaging network comprises a parallel backplane between Web interface module and the programmable logic controller and a serial network between the backplane and the I/O modules.

However, Brown specifically discloses a serial network as the messaging network at col. 4, lines 25-35.

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the serial network as taught by Brown, because this system would be versatile. Neither Lindner nor Brown teaches a parallel backplane. However, Papadopoulos does at col. 4, lines 25-35.

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner and the serial network as taught by Brown with the backplane of Papadopoulos, because this system would be versatile.

As to claim 21, Lindner does not teach the industrial control system of claim 20 wherein the network interface of the Web interface module attaches to the backplane.

However, Papadopoulos specifically discloses such configuration. (See Fig. 2 and Fig. 3.).

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the configuration taught by Papadopoulos, because this system would be more robust. As to claim 22, Lindner does not teach the industrial control system of claim 10 wherein the network interface of the Web interface module attaches to the serial network.

However, Brown specifically discloses such network at col. 4, lines 25-35.

It would have been obvious at the time of the invention for an artisan of

ordinary skill in the art to combine the teachings of Lindner as articulated above with the serial network taught by Brown, because this system would be flexible. Neither Lindner nor Brown teaches network interface of the Web interface module attaches to the serial network. However, Papadopoulos specifically discloses such configuration. (See Fig. 2 and Fig. 3.).

It would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the configuration taught by Papadopoulos, because this system would be more robust.

7. Claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over Lindner et al. (US 6,640,140) in view of Hauet (US 6,799,077.).

Lindner teaches the invention substantially as claimed including PLC executive with integrated web server (see abstract).

Lindner teaches the invention substantially as claimed including a programmable logic controller for use as part of an industrial control system or as part of n automated system and a corresponding method, the controller including an interface to the Internet, and including a web server allowing a remote computer to access web pages maintained by the controller providing information relevant to the control function of the controller such as control sensor readings and, optionally, information about the status of the control

system. (See abstract.).

As to claim 3, Lindner does not expressly teach the Web interface module of claim 1 wherein the network interface provides a connected messaging protocol.

However, Hauet specifically discloses such network at col. 4, lines 35-45 (IP datagrams).

it would have been obvious at the time of the invention for an artisan of ordinary skill in the art to combine the teachings of Lindner as articulated above with the serial network as taught by Brown, because this system would be versatile.

(10) Response to Argument

Appellant's arguments filed 07/31/07 have been fully considered but they are not persuasive

(A) On pages 9-11, Appellant argues that Papadopoulos '061 does not teach allowing the writing of data to the I/O modules directly from the Web "without intervention of the programmable logic controller". Appellant further argues that Papadopoulos '061 provides no suggestion that there can be communication between the Web server 30 and the I/O modules 40 that does not pass through the PLC.

In regards to point (A), examiner respectfully disagrees.

In figure 2 and in column 4, lines 39-53, Papadopoulos discloses a web server 30. The web server 30 provides a direct connection for a programmable logic controller (PLC) 32 to the Internet 14 (web server 30 is plugged into the PLC's backplane 34, i.e. there is no intermediate device between the web server and the I/O). Given that a **backplane** is a circuit board (usually a printed circuit board) that connects several connectors (i.e. I/O connectors) in parallel to each other, so that each pin of each connector is linked to the same relative pin of all the other connectors, forming a computer bus, it is clear that a direct connection is provided. Therefore, there is communication between the web server and the I/O without the intervention of the PLC.

(B) On pages 11-12, Appellant argues that there is no reference to a write disable command in column 4 of the Lindner reference, and further argues that Katsuhiko does not remedy the deficiencies in Lindner.

In regards to point (B), examiner agrees that there is no reference to a write disable command in column 4 of Lindner, but respectfully disagrees that Katsuhiko not meet this limitation.

On page 1, Katsuhiko discloses a sequence engine 22 that judges whether or not a write address is needed to stop software PLC itself and ends the process when the write access is not necessary, and further judges whether or not an I/O update is needed when the write access is necessary (i.e. "a write disable/able command" when it is judged necessary as described in Katsuhiko).

(C) Appellant argues that Lindner does not teach or suggest the use of a connected messaging protocol with the web interface of Lindner. This deficiency is not remedied by Hauet, which fails to teach connected messaging or any of the standard that would provide for connected messaging.

In regards to point (C), examiner agrees that Lindner does not teach the use of a connected messaging protocol, but respectfully disagrees that Hauet fails to teach this limitation.

Column 4, lines 36-44, Hauet discloses various programmed operating units of the industrial process control system that include HTTP servers that are provided with communications couplers compatible with the HTTP/TCP/IP protocols and services (i.e. "connected messaging protocol") in addition to the standard protocols and services of the local area network(s) used. They are thus capable of transmitting and receiving IP datagrams conveyed by said network(s), without disturbing the deterministic information interchange related to real-time process control.

(D) Appellant argues that Papadopoulos fails to meet these claims, which required: where the transfer of data between the Web accessing communications medium and the I/O is implemented through the I/O image table.

In regards to point (D), examiner respectfully disagrees.

In column 8, table 1, Papadopoulos discloses: Show the home page, Show the programmable logic controller's configuration, Show the Ethernet statistics, Show the read register request page, Show the 4.times. registers,

Show the racks attached to the controllers back plane, and Send an image. The different images are gif files that are displayed on the various pages: Show the remote I/O statistics, Show the list of configured remote I/O drops, Show a remote I/O rack's configuration and health, Show a remote I/O drop's communication statistics, Show the I/O reference values of a remote I/O module, Show a list of configured distributed I/O nodes, Show the configuration and the health of a distributed I/O node, and Show the I/O reference values of a distributed I/O module.

The Appellant invention in substance claims "a Web interface module that includes I/O module for sending and receiving electrical signals to and from an industrial process, the web interface comprising: executing a stored interface program to communicate directly with at least one I/O module and to pass data between the Web accessing communications medium and the I/O module, the passing of data including the writing of data to the I/O modules defining the electrical signals to be sent by the I/O module to the industrial process and the reading of data from the I/O modules defined by electrical signals received by the I/O modules from the industrial process; whereby communications may be had with the I/O module without intervention of the programmable logic controller". Lindner, Papadopoulos, Katsuhiko, Brown and Haut disclose all the claimed limitation as described in the above argued points.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

El Hadji Sall
Art Unit: 2157
July 5, 2007

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